

AMENDMENTS TO THE CLAIMS:

1. (Currently Amended) In a cooling system having a refrigerant evaporator, a heat exchanger comprising:

a suction line for refrigerant output from said evaporator, said suction line including first and second substantially parallel straight cylindrical portions connected in series ~~whereby said second straight cylindrical portion receives gaseous refrigerant from said first straight cylindrical portion; and~~

a capillary tube adapted to carry cooled refrigerant to said evaporator, said capillary tube including first and second helically wound portions connected in series whereby said second helically wound portion receives cooled refrigerant from said first helically wound portion, said first helically wound portion being wrapped around said suction line second straight cylindrical portion and said second helically wound portion being wrapped around said suction line first straight cylindrical portion; and

an accumulator between said first and second cylindrical portions of said suction line;

whereby said suction line first straight cylindrical portion outputs gaseous refrigerant to said accumulator and said suction line second straight cylindrical portion receives gaseous refrigerant from said accumulator.

2. (Currently Amended) The In a cooling system having a refrigerant evaporator, a heat exchanger of claim 1, further comprising:

a suction line for refrigerant output from said evaporator, said suction line including first and second substantially parallel straight cylindrical portions connected in series whereby said second straight cylindrical portion receives gaseous refrigerant from said first straight cylindrical portion;

a capillary tube adapted to carry cooled refrigerant to said evaporator, said capillary tube including first and second helically wound portions connected in series whereby said second helically wound portion receives cooled refrigerant from said first helically wound portion, said first helically wound portion being wrapped around said suction line second straight cylindrical portion and said second helically wound portion being wrapped around said suction line first straight cylindrical portion; and

a bypass safety valve between an inlet to said first helically wound portion of said capillary tube and an outlet from said second helically wound portion of said capillary tube, said bypass safety valve opening responsive to a selected pressure differential between said inlet to said first helically wound portion of said capillary tube and said outlet from said second helically wound portion of said capillary tube.

3. (Withdrawn) The heat exchanger of claim 1, wherein said suction line includes a U-shaped portion connecting said first and second cylindrical portions of said suction line.

4. (Canceled)

5. (Original) The heat exchanger of claim 1, wherein said refrigerant comprises CO₂ and said capillary tube is an expansion device for said cooled CO₂ refrigerant.

6. (Original) The heat exchanger of claim 1, wherein said cooling system is transcritical.

7. (Withdrawn) In a cooling system having a refrigerant evaporator, a heat exchanger comprising:

a suction line for refrigerant output from said evaporator, said suction line including
a straight portion substantially cylindrical about an axis, and
an accumulator between said evaporator and said suction line straight portion, said accumulator including
a phase separation chamber having an input for refrigerant from said evaporator and an outlet for gaseous refrigerant from which oil

and liquid droplets have been separated in said phase separation chamber,

a accumulator including a discharge opening for discharging oil to return said oil to said system,

a vertical pipe between said phase separation chamber and said accumulator; and

a capillary tube adapted to carry cooled refrigerant to said evaporator, said capillary tube including a portion helically wound around a central axis generally coinciding with said suction line straight portion axis.

8. (Withdrawn) The heat exchanger of claim 7, further comprising a second vertical pipe between said phase separation chamber and said accumulator, said second vertical pipe adapted to hold a selected volume of refrigerant charge.

9. (Withdrawn) The heat exchanger of claim 7, wherein said cooling system is transcritical.

10. (Withdrawn) The heat exchanger of claim 7, wherein said refrigerant comprises carbon dioxide.

11. (New) The heat exchanger of claim 2, further comprising an accumulator between said first and second cylindrical portions of said suction line.

12. (New) The heat exchanger of claim 2, wherein said refrigerant comprises CO₂ and said capillary tube is an expansion device for said cooled CO₂ refrigerant.

13. (New) The heat exchanger of claim 2, wherein said cooling system is transcritical.